

IBM Cloud Infrastructure Center - Use Cases and Demo

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IBM Z | IBM LinuxONE

Agenda

- IBM Cloud Infrastructure Center – Overview
- Use Case
- Opportunity
- Red Hat OpenShift z/VM UPI install with IBM Cloud Infrastructure Center
- Cloud Infrastructure Center Telemetry Data

IBM Cloud Infrastructure Center



IaaS – Solution	Continuous Delivery
PaaS Integration	RH CoreOS provisioning

Your IaaS solution for IBM Z and LinuxONE

Integration of IBM Z/LinuxONE with cloud management tools

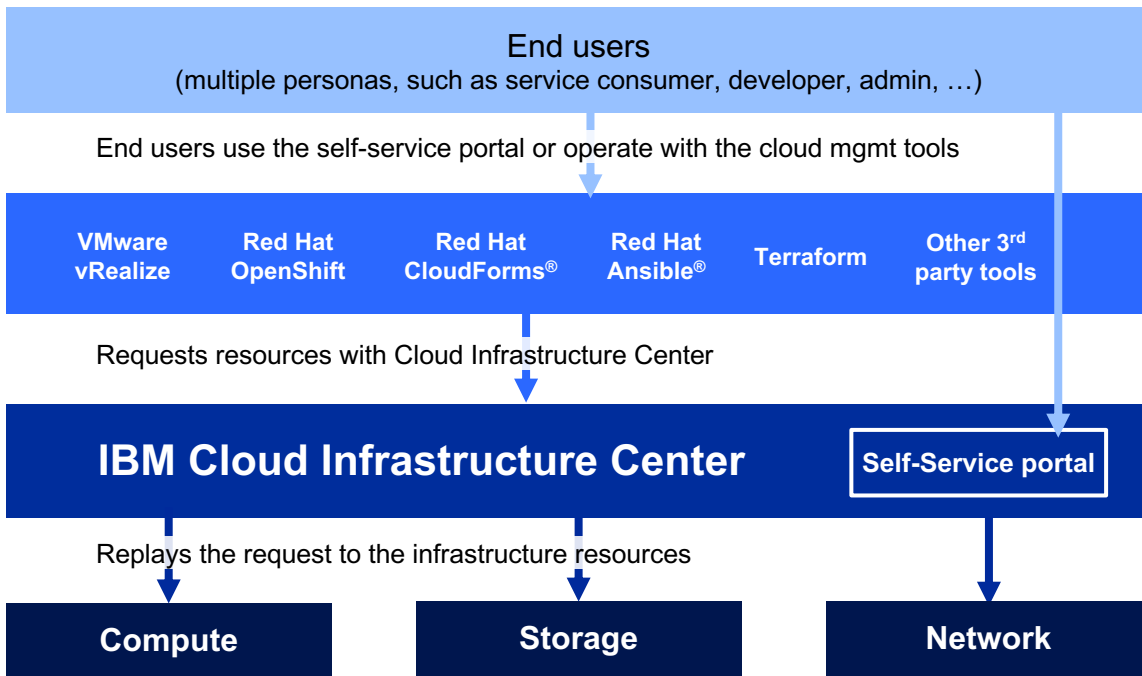


Connecting the layers of cloud computing enables businesses to integrate IBM Z/LinuxONE infrastructure across the enterprise

Platform-as-a-service (PaaS) layer
Cloud management tooling

Infrastructure-as-a-service (IaaS) layer

Infrastructure resource layer



Use cases of IBM Cloud Infrastructure Center

Foundation for scalable IaaS cloud management across the enterprise



Customer needs: Automated infrastructure mgmt. – Agile & cloud native dev. – Hybrid cloud integration

Infrastructure management

Instantiate, define, capture, and manage the lifecycle of virtual machines on IBM Z / LinuxONE

Cloud automation

Automate the cloud infrastructure management via industry-standard APIs, while leveraging IBM Z / LinuxONE investments

Cloud integration

Integrate the IBM Z / LinuxONE-based cloud infrastructure across the enterprise by connecting the layers of cloud computing

Infrastructure Management

Virtual machine lifecycle and provisioning



Value

- Start, Stop, Delete and Restart of virtual machines
- Quickly deploy by launching a stored image or utilizing a template
- Capture/Snapshot and maintain a library of images

IBM Cloud Infrastructure Center Configuration Messages Requests Idaproof (ibm-default) IBM

Virtual Machines

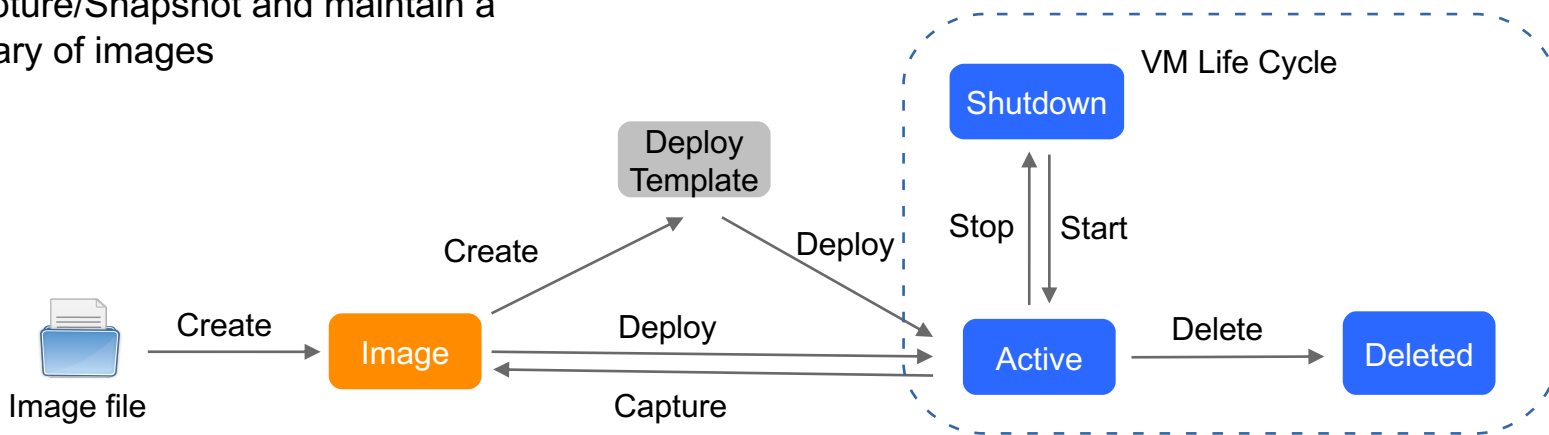
Refresh Start Stop Restart Delete Capture Edit Expiration Date Attach Volume Manage Existing Filter

Unmanage

No filter applied

Name	Host	IP	State	Operating System	Owner	Expiration Date
Your-New-Virtual-Machine	demo57	10.4.2.75	Active	RHEL7.8		None
demo57_vm1	demo57	10.4.2.15	Active	RHEL7.8		None
zvmimg-0rootdisk	demo57	10.4.2.254	Active	RHEL7.8		None

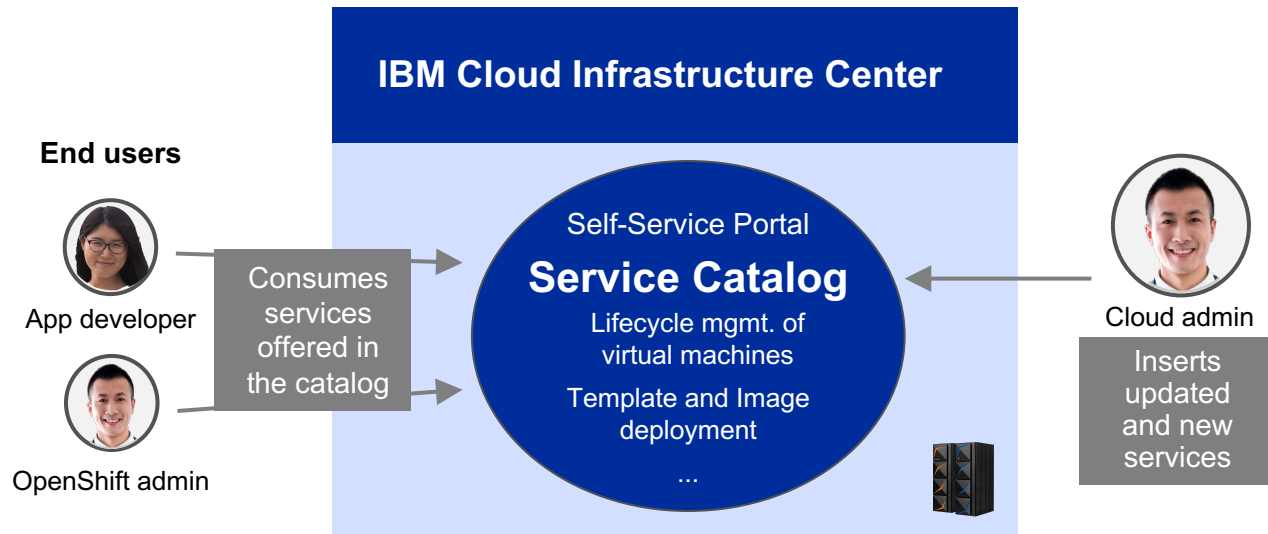
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Automation of cloud infrastructure

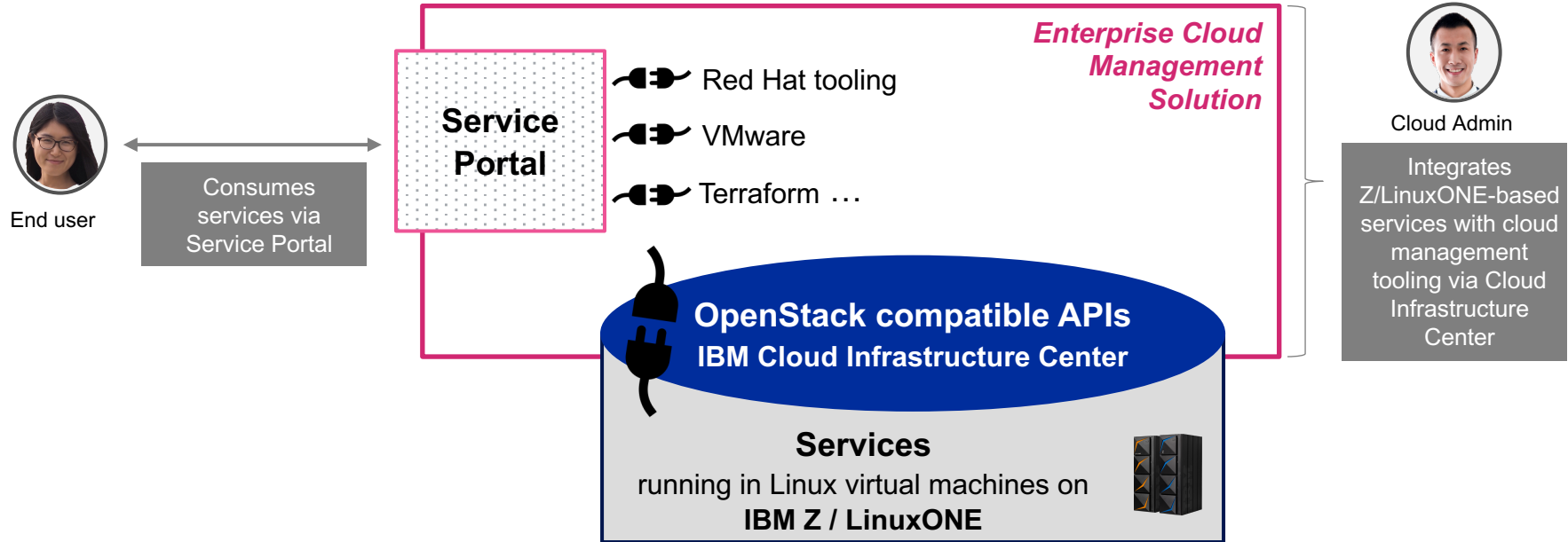


Cloud automation, built on **industry-standard APIs**, provides high level of **investment protection** as the cloud platform is abstracted by the IaaS layer.



End users can consume required services from the service catalogue in the self-service portal, without worrying about infrastructure details or acquire deep technical skills.

Integration into enterprise cloud management



Via OpenStack compatible APIs, IBM Cloud Infrastructure Center allows for easy integration with cloud management tools to provide an out-of-the-box experience to end users.

Opportunities

User-provisioned infrastructure (UPI) via IBM Cloud Infrastructure Center

IBM Cloud Infrastructure Center supports provisioning of Red Hat Enterprise Linux CoreOS

Blog: [Installing Red Hat OpenShift Container Platform \(UPI\) via IBM Cloud Infrastructure Center](#)

IBM Cloud Infrastructure Center OCP UPI Ansible Playbooks:

https://github.com/IBM/z_ansible_collections_samples/tree/master/z_infra_provisioning/cloud_infra_center/ocp_upi

Blog: [Using the Ansible playbook to operate IBM Cloud Infrastructure Center](#)



RED HAT[®]
OPENSIFT
Container Platform

IBM CIO Office – integrating IBM Z into the hybrid cloud



Business challenge

Using a traditional IT operations model, it is hard and complex to manage the infrastructure assets across multiple platforms. Individual management pillars exist for the infrastructure components. The existing management tooling does not support all Linux® commands, which requires to develop scripts, and many admin tasks are done manually.

Transformation

As part of the consolidation of the IT environment, the transition from the traditional IT operations model to a cloud operations model was implemented. The tooling is now based on the industry-standard OpenStack APIs, which enabled the integration of the IBM Z environment into CIO Office's hybrid cloud, and with the new user portal the user experience is strongly improved.

Business benefits:

Standardization

enabled the integration of all platforms into end user portal

Accelerates

the entire setup, can be done in a few steps, quickly and cost efficiently

Reduces

costs and complexity to manage a huge environment

[Read the full story](#)

IBM CIO Office

Transformed to a cloud operations model and integrated IBM Z into hybrid cloud

The company owns delivery of the private cloud strategy and provides the tools and infrastructure that developers and application owners use to do their jobs every day with speed, scale and security.

IBM Cloud Infrastructure Center provides an infrastructure-as-a-service (IaaS) layer for IBM Z, enabling virtual machines to be provisioned and managed and the automation of services, and providing a platform for building higher-level cloud services.

“IBM Cloud Infrastructure Center allows us to substantially improve our infrastructure management and reduce cost & complexity to manage from simple to complex environments.”

—Eric Everson Mendes Marins,
IBM CIO Office



Get started today!



Learn more

- Watch [IBM Cloud Infrastructure Center webpage](#)
- Read the [technical blogs and announcements](#)
- Check out the [technical details at the IBM Documentation](#)
- Request [a demo](#)

(if the direct link does not work, copy this URL in the browser: <https://www.ibm.com/it-infrastructure/services/client-experience-portal/offeringdetail.jsp?offid=2056>)

IBM Cloud Infrastructure Center - Red Hat OpenShift z/VM UPI

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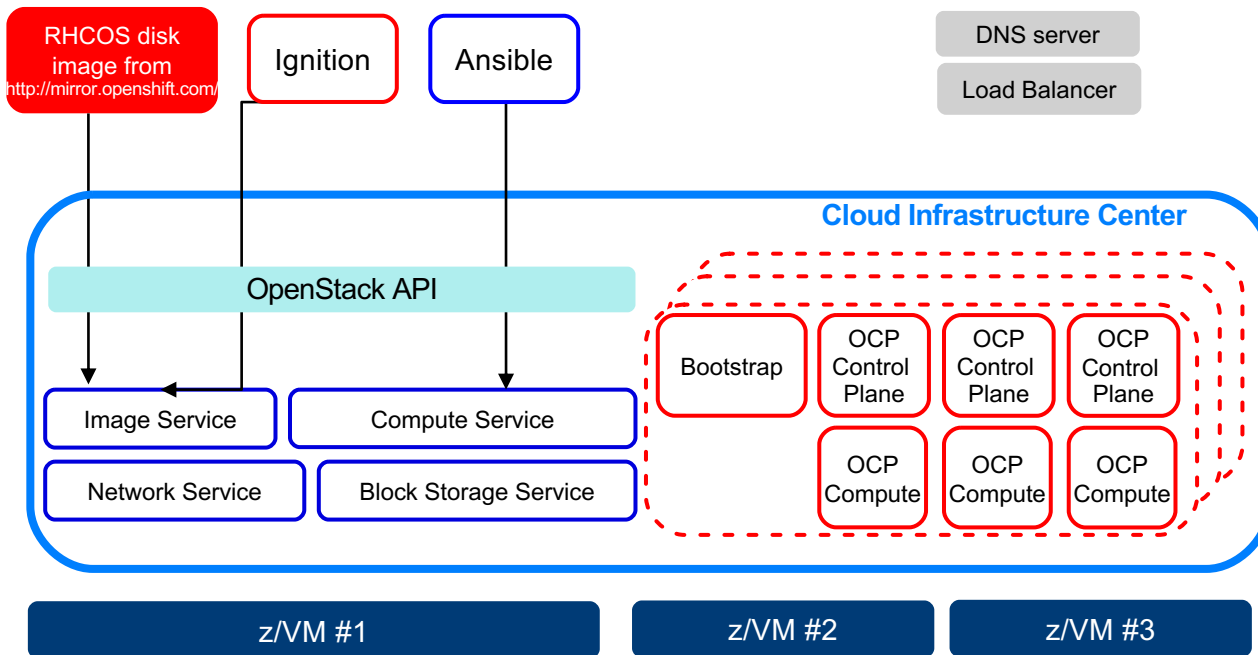
Agenda

- Red Hat OpenShift Container Platform on IBM Z and LinuxONE installation support status
- Red Hat OpenShift z/VM UPI with Cloud Infrastructure Center
- Comparison IBM z/VM UPI with and without Cloud Infrastructure Center
- Demo – Create Red Hat CoreOS virtual machine

Red Hat OpenShift IBM Z Installation Support Status

- Red Hat OpenShift IPI vs. UPI
 - IPI – installer provisioned infrastructure, full stack automation, cluster managed infrastructure
 - UPI – user provisioned infrastructure, user managed infrastructure
- Red Hat OpenShift Z only supports UPI, not IPI
 - Lots of manual steps to deploy the Red Hat OpenShift cluster
 - Users will manage and maintain Red Hat OpenShift cluster infrastructure
- UPI with Cloud Infrastructure Center
 - Cloud Infrastructure Center provisioned and managed infrastructure
 - Supports both z/VM and KVM UPI

Red Hat OpenShift (OCP) z/VM UPI with Cloud Infrastructure Center



- **Image Service**
 - Red Hat CoreOS (RHCOS) image
 - bootstrap ignition file
- **Compute Service**
 - provision RHCOS OCP nodes
- **Network Service**
 - RHCOS network configuration
 - Static IP or allocate from IP range
- **Block Storage Service**
 - RHCOS FCP root disk
 - OCP persistent volume
- Provides OCP nodes **multi-tenancy** support and **life cycle management**

z/VM UPI vs. Cloud Infrastructure Center z/VM UPI

z/VM UPI	Cloud Infrastructure Center z/VM UPI	Cloud Infrastructure Center z/VM UPI + icic_ocp_upi_playbooks (Ansible)
Day-0 preparation		
Download the OpenShift installation program and CLI, Generate install config and ignition files, Setup DNS, load balancer	Download the Red Hat OpenShift installation program and CLI, Generate install config and ignition files, Setup DNS, load balancer	Configure-pre-check configure-installer-and-image Configure-install-config Configure-install-ignition Configure-dns configure-haproxy
Day-1 installation&configuration		
Download Red Hat CoreOS kernel image and initramfs image , send to each zvm systems	Download Red Hat CoreOS disk image and upload onto Cloud Infrastructure Center image service. One time effort, the image will be sent to each compute nodes automatically	configure-installer-and-image
Setup HTTP/ HTTPS/ FTP server, upload Red Hat CoreOS rootfs image and ignition config file	Ignition file can be uploaded onto Cloud Infrastructure Center image service	configure-install-ignition
Create z/VM userid for Red Hat OpenShift nodes	Provision Red Hat CoreOS via Cloud Infrastructure Center (API or web UI), specify ignition file as user data when provisioning the Red Hat CoreOS virtual machine Be able to create deploy template for Red Hat OpenShift master nodes and worker nodes	configure-bootstrap configure-control-plane configure-compute-nodes
Prepare kernel parm file for each Red Hat OpenShift nodes		
Punch kernel image, initramfs and kernel parmfile to target VM's reader device		
IPL from the reader, install Red Hat CoreOS via coreos-installer		
Day-2 operation		
Red Hat OpenShift node life-cycle management	Cloud Infrastructure Center support	configure-compute-nodes
Add new worker nodes	Add new worker nodes via Cloud Infrastructure Center (API or web UI)	-
Others like monitoring, logging ..	Cloud Infrastructure Center supports	-

Benefits

- Simplified & automated installation steps!
- Less z/VM skills required!

- Better user experience!
- Helpful to manage and maintain Red Hat OpenShift nodes!
- Easy to be integrated!

All Steps Automated!

https://github.com/IBM/z_ansible_collections_samples/tree/master/z_infra_provisioning/cloud_infra_center/ocp_upi

Demo

- Create Red Hat CoreOS virtual machine
- Red Hat CoreOS image management and deploy template
- Upload ignition config file onto Cloud Infrastructure Center
- Red Hat CoreOS network configuration
- Red Hat CoreOS boot from FCP SCSI disk

IBM Cloud Infrastructure Center - Monitoring

DCC

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Container Platform on IBM Z and LinuxONE
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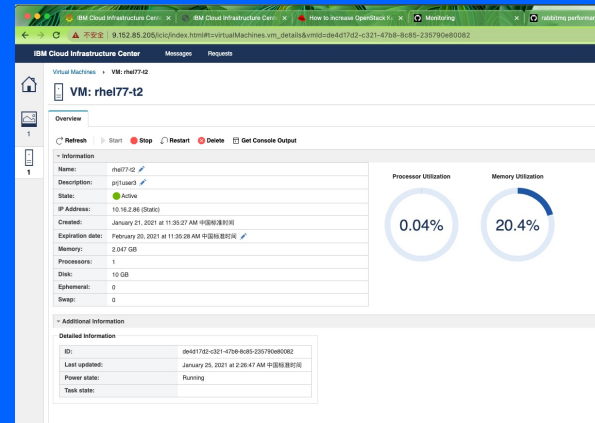
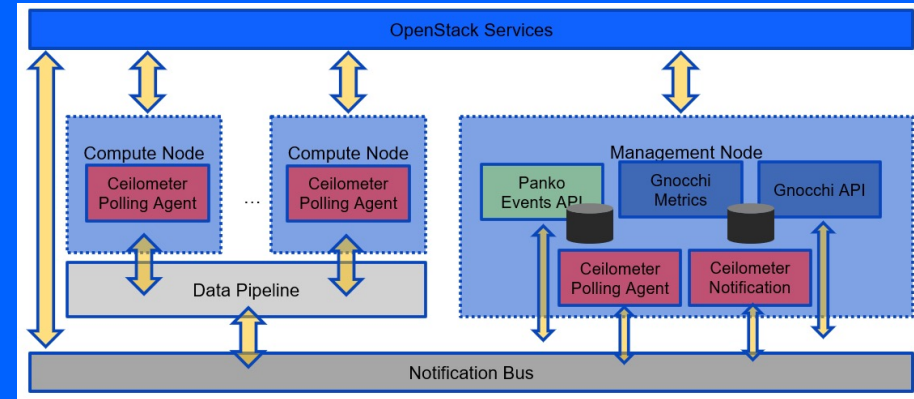
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Agenda

- Cloud Infrastructure Center Monitoring Overview
- Monitoring Scenarios
 - Monitoring the Cloud Infrastructure Center services
 - Monitoring the virtual machines (VMs)
- Demo

Cloud Infrastructure Center Monitoring Overview

- Environment Checker
 - Installation verification program
- Health Check
 - Management
 - Compute
 - Storage Provider
- Notification
- Telemetry Services



Telemetry Services

- Compute Node
 - Ceilometer polling agent
- Management Node
 - Ceilometer polling agent
 - Ceilometer notification agent
 - Gnocchi metric Server
 - Gnocchi API Server
 - Panko API Server

The Telemetry services will be disabled by default, will need to use the following command to enable them before using:

```
icic-config metering manage-service --enable panko  
icic-config metering manage-service --enable ceilometer  
icic-config metering manage-service --enable gnocchi
```

Hypervisor Support

- IBM z/VM Hypervisor
- KVM Hypervisor

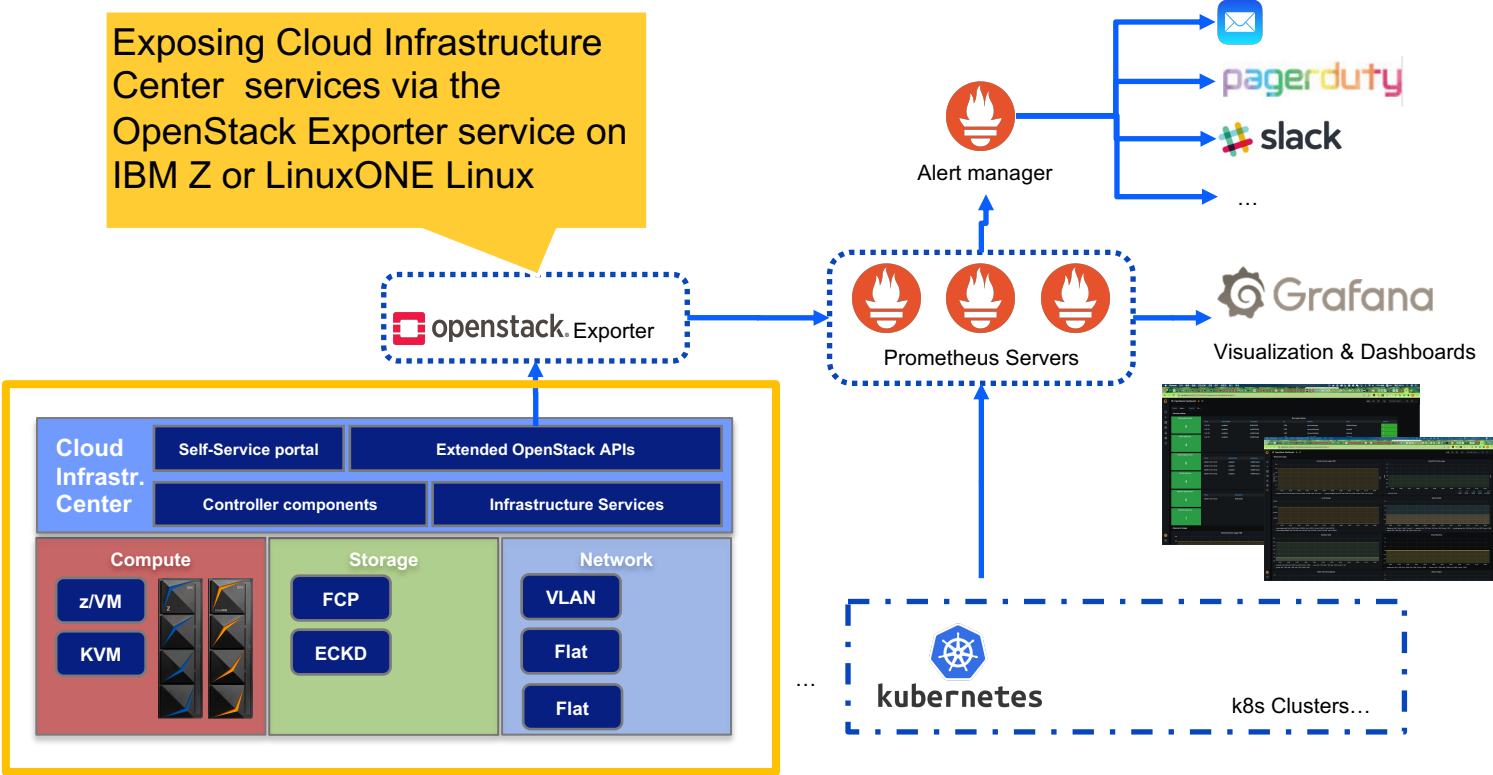
Monitoring Scenarios

1. Monitor the IBM Cloud Infrastructure Center services
2. Monitor the VM instances managed by IBM Cloud Infrastructure Center



Scenario 1: Integrate Cloud Infrastructure Center with existing IT monitoring infrastructure

Exposing Cloud Infrastructure Center services via the OpenStack Exporter service on IBM Z or LinuxONE Linux



Services Sample Dashboard : service status

General / CIC Services Dashboard ☆ 🔊

Cluster None Interval 1m

Service status

Nova agents down

0

Nova agents up

5

Cinder agents down

0

Cinder agent up

3

Neutron agents down

0

Neutron agents up

6

Nova agent status							
Time	adminState	hostname	id	service	zone	Status	
1.62 Tri	enabled	os00c	7.00	nova-compute	Default_Group	1	
1.62 Tri	enabled	os01c	6.00	nova-compute	Default_Group	1	
1.62 Tri	enabled	os01d	3.00	nova-conductor	internal	1	
1.62 Tri	enabled	os01d	4.00	nova-health	internal	1	
1.62 Tri	enabled	os01d	5.00	nova-scheduler	internal	1	

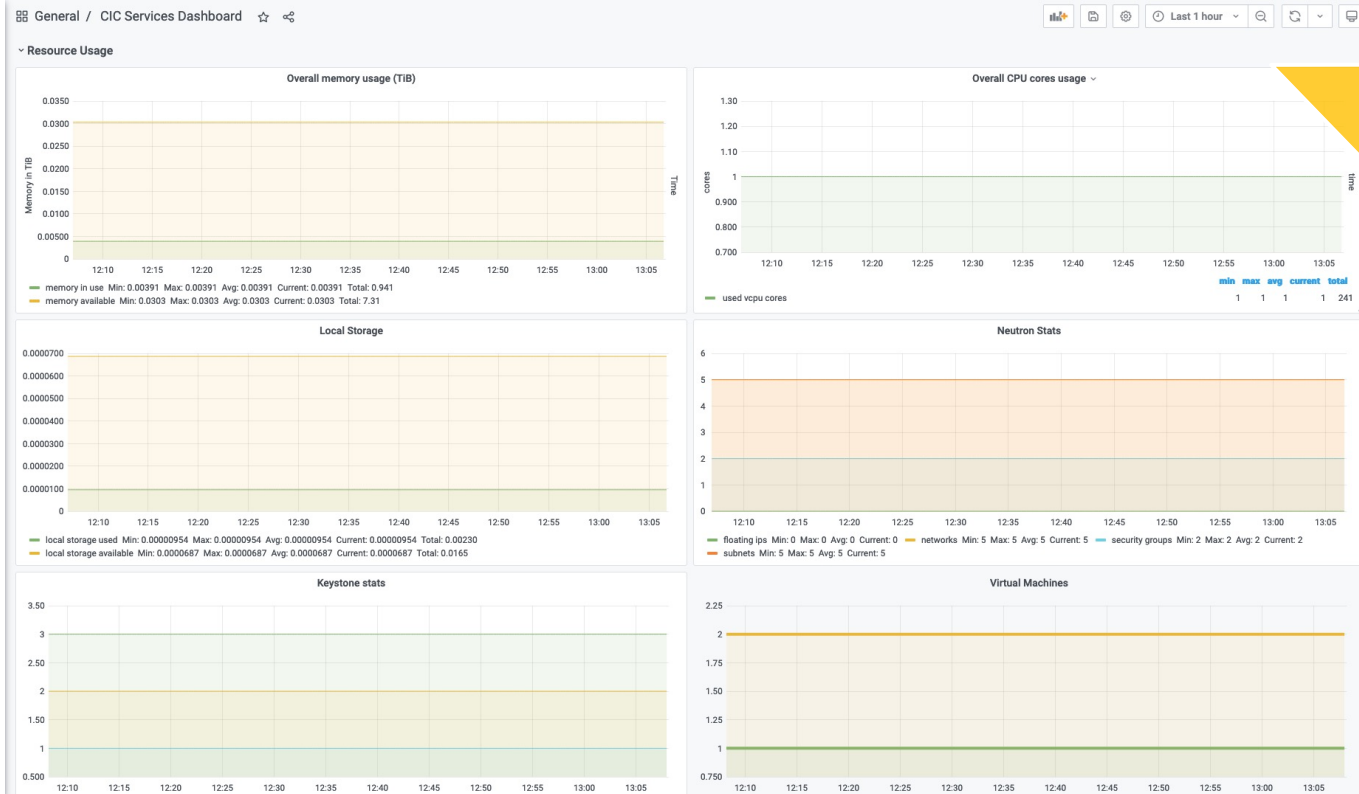
Cinder agent status							
Time	adminState	hostname	id	service	zone	Status	
2021-06-04 13:06	enabled	os01d	cinder-conductor	b4845a92-7533-cc7-d-aceb-7e84c65131e2	Default_Group	1	
2021-06-04 13:06	enabled	os01d	cinder-health	c664d3a6-e745-7a0-e-d895-0e78fd3718dd	Default_Group	1	
2021-06-04 13:06	enabled	os01d	cinder-scheduler	a933184c-aa0f-c92-!-0b3b-6bc3d891e4dd	Default_Group	1	

Neutron agent status							
Time	hostname	id	service	Status			
2021-06-04 13:06	os00c	3f08966e-bdce-4f02-a770-b44263392d75	neutron-metadata-agent	1			
2021-06-04 13:06	os00c	5102b9cd-5d4b-41c8-91df-1ccb26c4a766	neutron-dhcp-agent	1			
2021-06-04 13:06	os00c	783c9d6e-2694-4a10-b0f7-372899c97da7	neutron-openvswitch-agent	1			
2021-06-04 13:06	os01c	421cf2c1-9623-4cb5-88f2-96c3adadc012	neutron-metadata-agent	1			
2021-06-04 13:06	os01c	7c0bdd93-2dd6-4cc2-ac5e-f36c4fa8eb21	neutron-dhcp-agent	1			
2021-06-04 13:06	os01c	d3d2f124-f4d5-419d-9db7-a4ede9efdb93	neutron-openvswitch-agent	1			

Service status

- Nova
- Cinder
- Neutron

Services Sample Dashboard: service statistics

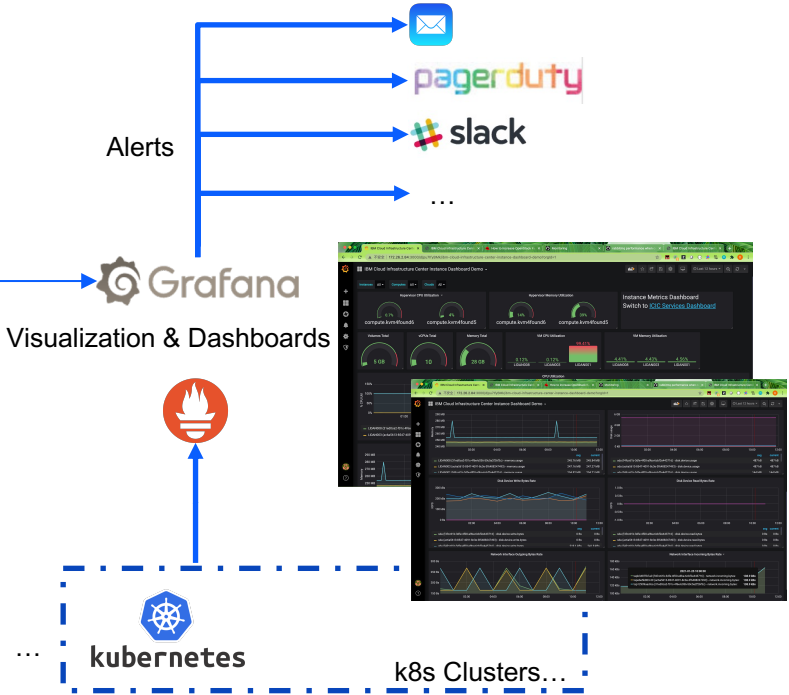
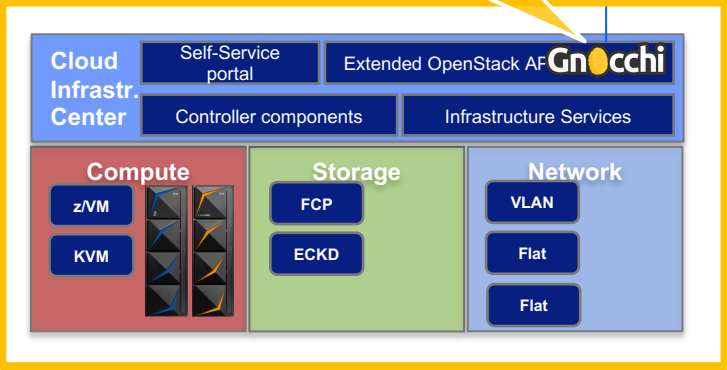


Service Stats

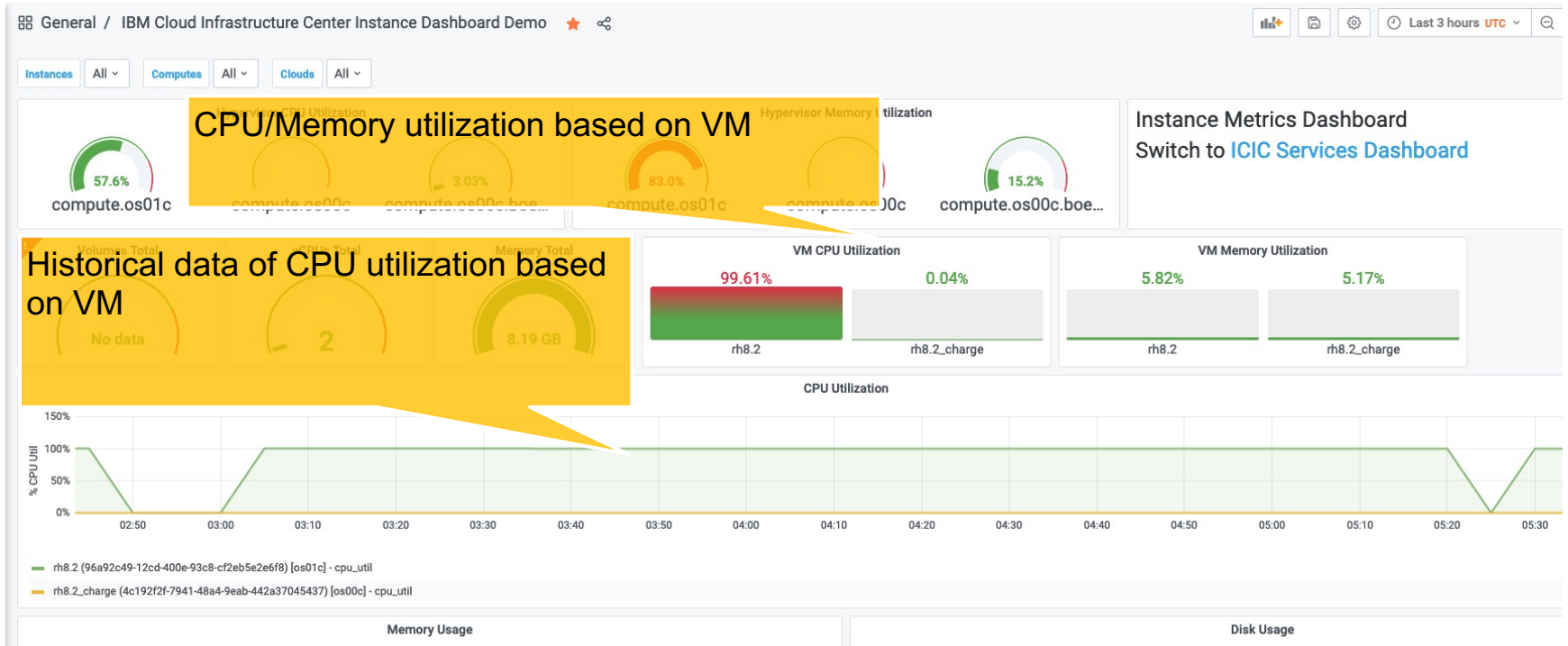
- Memory
- CPU
- Storage
- Cinder
- Keystone
- Glance Images
- VM

Scenario 2: Monitor the VM instances managed by the Cloud Infrastructure Center

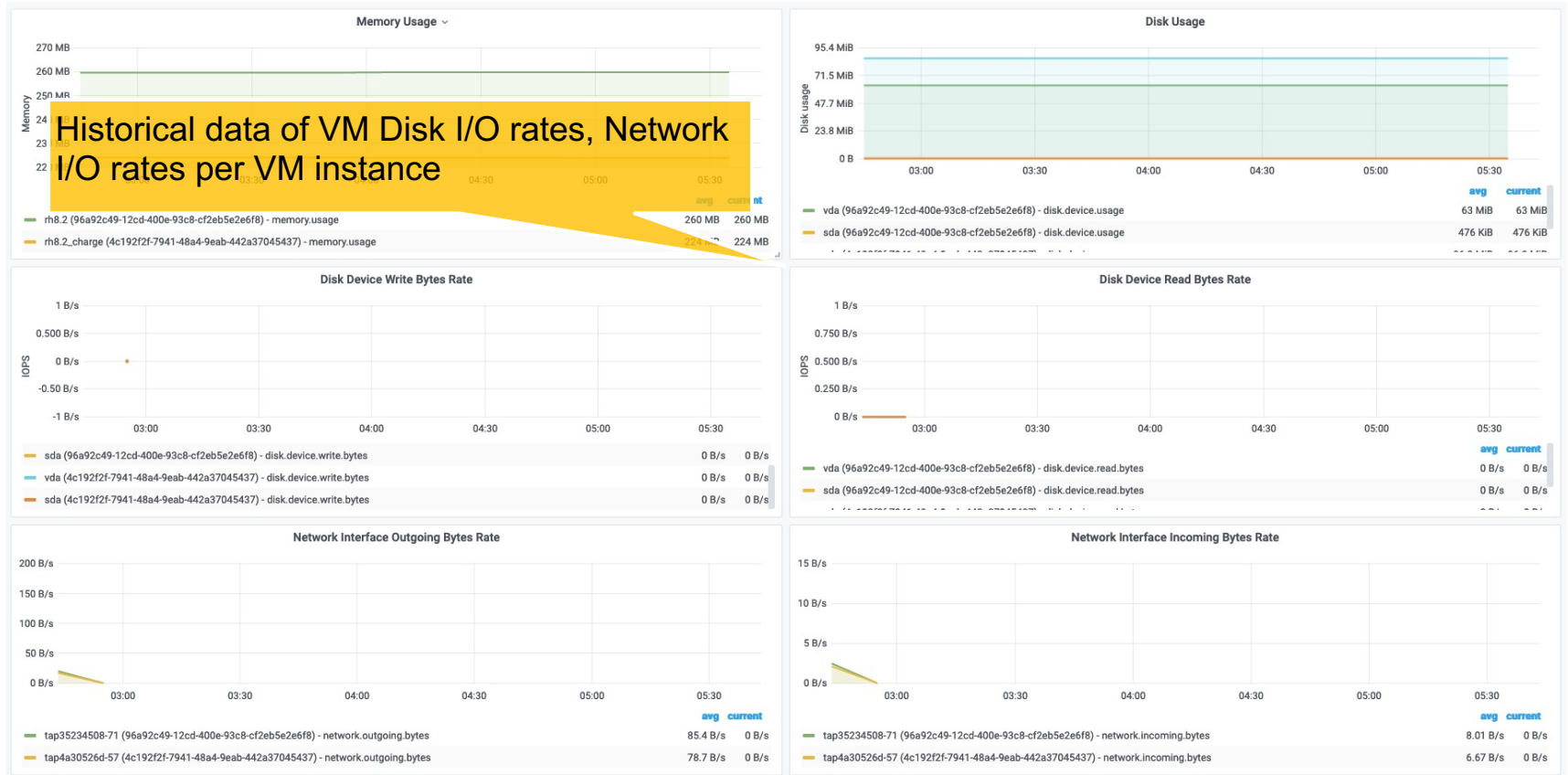
Exposing z/VM or KVM instances' monitoring data via the Gnocchi service



VM Sample Dashboard: CPU/Memory utilization



VM Sample Dashboard: Network/Storage utilization



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